Table 3. Event study results for Bitcoin log returns. Cumulative abnormal return (CAR) of Bitcoin around Bitcoin-specific tweets by Elon Musk for non-negative and negative events.

Class	Event	Tweet	[0, 1]		[0, 5]		[0, 10]		[0, 60]		[0, 120]	
			CAR	t-stat.	CAR	t-stat.	CAR	t-stat.	CAR	t-stat.	CAR	t-stat.
Non-negative events	2	Bitcoin is *not* my safe word	0.302%	0.37	0.025%	0.19	0.034%	0.25	-0.381%	-0.88	-0.477%	-0.78
	4	Bitcoin is my safe word	-0.035%	-0.11	0.048%	0.18	0.220%	0.72	-0.253%	-0.46	-0.101%	-1.18
	8	In retrospect, it was inevitable [Twitter bio change]	-0.029%	-0.66	0.075%	0.20	0.331%	0.56	13.645%	1.94*	14.258%	1.76
	13	This is true power haha	0.080%	10.44***	0.110%	0.18	-0.016%	-0.02	-0.548%	-0.51	0.494%	0.36
	17	Cryptocurrency explained	0.189%	18.19***	0.743%	1.82*	1.087%	1.80*	1.743%	1.62	2.909%	2.16*
	23	BTC (Bitcoin) is an anagram of TBC	-0.004%	-0.01	-0.261%	-0.44	-0.108%	-0.18	-0.945%	-0.95	-1.606%	-1.18
	25	You can now buy a Tesla with Bitcoin	0.800%	0.99	0.989%	0.90	0.112%	1.00	1.630%	1.17	2.829%	1.63
	37	Tesla has 🔆	-0.084%	-0.07	3.259%	1.05	4.933%	1.52	9.328%	1.83*	16.927%	2.69**
	39	Spoke with North American Bitcoin miners	1.236%	1.15	3.307%	1.22	3.771%	1.37	2.428%	0.74	1.538%	0.42
	43	How many Bitcoin maxis does it take	-0.170%	-9.73***	0.887%	1.37	0.065%	0.07	-0.213%	-0.21	0.398%	0.28
	Full sample (n=10)		0.258%	1.41	1.049%	2.23*	1.043%	2.05*	2.643%	1.79*	3.717%	1.81*
Negative evennts	21	Scammers & crypto should get a room	0.024%	0.08	0.374%	0.62	0.425%	0.68	0.450%	0.43	0.915%	0.56
	34	Tesla & Bitcoin	-1.200%	-0.86	-3.861%	-1.73	-2.858%	-1.02	-3.174%	-0.91	-11.865%	-1.84*
	35	Energy usage trend over past few months	0.112%	0.14	0.177%	0.19	0.916%	0.95	-0.244%	-0.12	1.250%	0.46
	42	#Bitcoin [picture of a couple's conversation]	0.076%	0.27	-0.750%	-1.44	-2.183%	-2.77***	-2.144%	-1.50	-2.882%	-1.58
	Full sample (n=4)		-0.246%	-0.78	-1.015%	-1.04	-0.925%	-0.99	-1.279%	-1.53	-3.145%	-1.03

*, **, *** indicate significance at the 10%, 5% and 1% level.

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Table 3 shows event study results for negative versus non-negative events. Individual CARs for each event are also presented to allow readers to evaluate individual events and to devise their own classification. For the ten non-negative events, we find that, except for the two-minute period after the event, all periods considered are associated with significant positive abnormal returns. They amount to around 1% in the first 5 and 10 minutes, increase to 2.6% over one hour, and reach 3.7% after two hours. Thus, contrary to our earlier results, here we find that Musk's tweets do have a significant impact on Bitcoin returns. Note, however, that the effects vary substantially, depending on the contents of the tweets. In particular, the tweets on the Twitter bio change (13.645% after one hour and 14.258% after two hours) and on Tesla having diamond hands (9.328% and 16.927%) triggered especially large effects.

In the sample of negative events, we fail to identify any significant abnormal effect for the full group, which may be due to the low number of observations. However, the abnormal returns are consistently negative. The tweet *Tesla & Bitcoin* (Tesla suspending Bitcoin for vehicle purchases) has the largest individual effects, with a significant negative abnormal return of 11.865% over a two-hour period. In sum, we conclude that the evaluation of tweets is a significant and important characteristic for the understanding or identification of short-term price and volume effects and that the effects of negative and non-negative events cancel each other out across the set of Bitcoin tweets.

5   Discussion

This article has aimed to identify the extent to which cryptocurrency-related tweets by Elon Musk directly affect the pricing and trading volume of cryptocurrencies. Being one of the richest and most influential people in the world, Musk regularly comments on cryptocurrencies, creating much resonance and discussion. Therefore, it is reasonable to assume that his statements influence investor behavior and consequently have a market impact. At the same time, his motives often remain unclear or become apparent only incidentally (e.g. Tesla buying Bitcoin). The extent of Musk's influence can be valuable information for the decision-making of (individual) investors or the regulatory process. For these reasons, we have sought to assess (1) the effect of Musk's cryptocurrency-related Tweets on the pricing and trading volume of cryptocurrencies and (2) whether the effects differ by cryptocurrency. Answering these questions can improve our understanding of the role of information, social networks, leadership and influencers on cryptocurrency markets. The results provide a way to determine the impact of unanticipated tweets on the informational efficiency of cryptocurrencies and provide insights into the perceived quality of influencer content in the context of signaling theory.

Musk's tweets on cryptocurrency allow us to test weak-form market efficiency using event study methodology. The results clearly show that Musk's tweets have significant impact on cryptocurrency markets in terms of pricing and trading volume, confirming our first research question. On average, a cryptocurrency-related tweet leads to significant abnormal returns of 1.46% already within the minute of posting, followed by another 1.50% and 0.62% in the next two minutes. Over a period of 30 minutes, the significant cumulative abnormal return amounts to about 4.5%. The effects on trading volume are even stronger. We identify highly significant increases in trading volume in every single minute and all aggregate time intervals following a

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tweet. This result is in line with existing studies on the significance of individual tweets by influential people for both stock markets (Brans and Scholtens, 2020; Ge et al., 2019) and cryptocurrency markets (Huynh, 2021).

We also find that the effects differ by cryptocurrency, affirming our second research question. Tweets that concern Dogecoin consistently drive significant positive returns and elevated trading volume of that currency, while the analogous relationship only holds for Bitcoin-related tweets regarding trading volume. We speculate that this is because Musk's tweets about Dogecoin are almost all positive, while the Bitcoin-related tweets are of varying tone, so positive and negative effects may cancel each other out. To investigate this conjecture, we divide the Bitcoin-related tweets into a non-negative and a negative sample. Indeed, tweets with a non-negative undertone are associated with significant positive abnormal returns. This result illustrates that Musk's tweets cannot be universally interpreted as a positive signal for cryptocurrency; instead, their content, framing or sentiment matters. This is no surprise, as the framing of information is a major determinant of its interpretation (framing effects, Tversky and Kahneman, 1981). Elon Musk's cryptocurrency-related tweets create attention—which is always positive for trading volume but ambivalent for pricing.

The results suggest that—in line with the concept of transference (Andersen and Baum, 1994)—Musk's followers lean on his reputation for success when evaluating new information about Bitcoin or Dogecoin, resulting in abnormal price and volume effects. As predicted by cognitive balance theory (Heider, 2013), followers try to strike a balance between Musk's statements and their image of him as a person. A positive assessment of Elon Musk entails a corresponding perception of the tweet on cryptocurrency, so the attitude towards the person is transferred onto the "product" (Ohanian, 1991). Mechanisms such as these underlie the power that influential people have in social networks. Does such power represent a problem? Signaling theory (Spence, 1973) would consider Musk's tweets to be quality signals to the market, which are immediately priced. Musk does not incur any signaling costs in the conventional sense but rather puts his reputation on the line and risks counter-signaling, e.g., by other opinion leaders (Feltovich et al., 2002; Wang et al., 2019). The market will only react as long as the signal (i.e. the tweet) has added value. If the market participants lose faith in the quality of the signal, they will simply ignore it. According to this view of the "Musk Effect", it is an uncritical aspect of financial market efficiency. The weak form of the market efficiency hypothesis states that markets reflect all available information (Fama, 1970), so only relevant information can have an effect. Yet the question of market efficiency is a purely theoretical one that ignores all moral aspects regarding the welfare of investors, especially given Musk's potential conflicts of interest, arising for example from Tesla's investment in Bitcoin.

As Bitcoin, Dogecoin or Ethereum do not pay dividends or otherwise share profits, their return hinges solely on increasing prices. Whoever buys at or near the highest price is bound to lose money. If a well-known person influences (retail) investors to buy cryptocurrency, this raises the probability that they end up paying the highest price—be it due to a cascade effect or, to use a popular term in the cryptocurrency market, FOMO (fear of missing out). Such influence over investors could be exploited in a fraudulent 'pump and dump' scheme, where the price of an asset is pumped up quickly before dumping it on stragglers (e.g., Hamrick et al., 2018).

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While we do not mean to imply that this was Elon Musk's intention, the sort of influence he wields clearly raises complex moral questions. On the one hand, we aspire to freedom of speech, but on the other hand, uninformed investors must be protected. Elon Musk plausibly claims that his tweets about Dogecoin were meant as a joke (Krishnan et al., 2021). Regarding Bitcoin, however, his motives appear less likely to be pure, considering that Tesla has acquired large holdings in that currency (U.S. Securities and Exchange Commission, 2021). A strategic campaign to influence investors could have a significant impact on society and the economy: If the richest person in the world alone can raise the price of Bitcoin by 16.9% or depress it by 11.8% through a simple social network message (cf. Table 3), it does not bear thinking about what a concerted effort by a group of rich people could do for their own wealth at the detriment of others. Furthermore, such a scheme could extend not just to cryptocurrencies but also to the more heavily regulated securities sector (cf. Brans and Scholtens, 2020; Ge et al., 2019). Clearly, freedom of speech comes at a cost.

To put these grave implications into perspective, however, we must note that this study is subject to several limitations, of which we can only list the most substantial ones. First, the tweet data were collected manually; we may well have missed relevant events (for example, tweets that merely allude to cryptocurrency). The list of all events in the appendix is intended to permit verification of our sampling. Second, it is important to keep in mind that our events may consist of several consecutive tweets. Of course, a second tweet within the same event can either strengthen or weaken any effect of the first tweet. While our analysis does not account for such compound effects, for the sake of transparency, the appendix shows the grouping of tweets into events. Finally, for lack of a better way, we classified Bitcoin-related tweets in a somewhat subjective manner. To minimize subjectivity, we had several experts rate the tweets, and we presented the rating and individual results transparently so that readers can easily explore alternative approaches.

Besides fixing these limitations, several other avenues for further research present themselves. While Elon Musk is clearly an extreme example in terms of social media influence, many less influential individuals, groups and companies also communicate their opinions on cryptocurrency via social media. A systematic classification of influencers in terms of their short-term impact on cryptocurrencies could be worthwhile, especially considering the risk of coordinated manipulation via 'pump and dump' schemes, as discussed above (Mirtaheri et al., 2019; Pacheco et al., 2020). Additionally, informed trading could be investigated by looking at trading volume before specific social media events (Ante, 2020; Feng et al., 2018) or by analyzing the transparent on-chain flow of cryptocurrencies and stablecoins (Ante et al., 2021). While the cryptocurrency-related Twitter activity of Elon Musk continues to warrant monitoring in the future, similar announcements worth investigating include those by *Michael Saylor*, CEO of Nasdaq-listed *MicroStrategy Inc.*, announcing the corporate acquisition of Bitcoins (e.g., Saylor, 2020), and El Salvador's president *Nayib Bukele*, announcing the acquisition of Bitcoin for his country (e.g., Bukele, 2021).

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6   Conclusion

We investigate the impact of 46 Twitter events by Elon Musk on the returns and trading volume of the cryptocurrencies he comments on. Across all events, the event study reveals significant increases in trading volume. Within two minutes after a tweet, there is a significant abnormal return of 3.58% and a highly significant increase in the trading volume of the cryptocurrencies mentioned in the tweets. Within the first hour after a tweet, the abnormal return even increases to 4.79%. More in-depth analysis shows that the significant return effects accrue exclusively to Dogecoin (5.11% over two minutes and 6.33% over one hour) but not to Bitcoin. Individual events regarding Dogecoin yield abnormal returns of up to 12.5% over 2 minutes and 26.5% over one hour. A more in-depth analysis of the Bitcoin tweets shows that the reason for the lack of significant results regarding this currency is likely an offsetting of negative and positive news. Considered in isolation, non-negative tweets from Musk lead to significantly positive abnormal Bitcoin returns. Individual tweets do raise the price of Bitcoin by 16.9% or reduce it by almost 11.8%. We thus conclude that Elon Musk's tweets do influence the cryptocurrency market. However, the identified "Musk Effect" of course need not persist in the future.

Our results beg the question under what conditions people of public interest should (be allowed to) comment on specific cryptocurrencies. A single tweet can cause a major movement in the price and trading volume of a cryptocurrency, which raises concerns about investor protection. No simple "solution" to that challenge is in sight, given the fundamental nature of the right to freedom of expression. With cryptocurrency markets still being largely unregulated, much analytical and regulatory work remains to be done here compared to, for example, stock markets, where similar challenges exist (e.g., Ge et al., 2019). While restrictions on the freedom of speech seem inconceivable at this stage, future legal research may want to look into a potential duty for influential individuals who publicly comment on individual cryptocurrencies to disclose any amounts of those currencies held by themselves or by entities under their control. Of course, any such initiative raises numerous challenges of implementation, such as how to define an influential individual or entity.

This study contributes to the research on information aggregation on the internet, especially in social networks by so-called influencers. It also provides a basis to gauge the impact of opinions expressed by highly influential people on the subject of cryptocurrency and financial markets. The results provide market participants with a better basis for deciding on the significance of specific tweets. Investors could develop an alternative investment strategy based on this information, regulators could analyze the need for market intervention and the influencers themselves can better judge the implications of their behavior on Twitter.

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Appendix

Table A.1. Cryptocurrency-related tweets of Elon Musk.

No	Event	Date	Time	Tweet	Coin	Link	Picture	Video	Link
1		02.04.19	22:16:00	Dogecoin rulz [picture of a doge with the caption "*draws cigarette* Doge? I haven't heard that name in years"]	DOGE	no	yes	no	Link
2		02.04.19	22:38:00	Dogecoin value may vary [link to an article entitled "Bitcoin Plunge Reveals Possible Vulnerabilities In Crazy Imaginary Internet Money"]	DOGE	yes	no	no	Link
3	1	30.04.19	03:15:00	Ethereum	ETH	no	no	no	Link
4	2	10.01.20	07:53:00	Bitcoin is *not* my safe word	BTC	no	no	no	Link
5	3	18.07.20	01:58:00	It's inevitable [picture of a "dogecoin standard" flooding the "global financial system"]	DOGE	no	yes	no	Link
6	4	20.12.20	09:21:00	Bitcoin is my safe word	BTC	no	no	no	Link
7		20.12.20	09:24:00	Bitcoin is almost as bs as fiat money	BTC	no	no	no	Link
8	5	20.12.20	10:30:00	One word: Doge	DOGE	no	no	no	Link
9	6	25.12.20	17:47:00	Merry Christmas & happy holidays! 🔹 [picture of doge underwear]	DOGE	no	yes	no	Link
10	7	28.01.21	23:47:00	[Picture of a "Dogue" magazine cover (as in Vogue)]	DOGE	no	yes	no	Link
11	8	29.01.21	09:22:00	In retrospect, it was inevitable [Twitter bio change to #bitcoin]	BTC	no	no	no	Link
12	9	04.02.21	08:35:00	Doge	DOGE	no	no	no	Link
13		04.02.21	08:57:00	Ur welcome [edited photo from Disney's Lion King where Musk holds a "baby Simba" doge]	DOGE	no	yes	no	Link
14		04.02.21	09:15:00	Dogecoin is the people's crypto	DOGE	no	no	no	Link
15		04.02.21	09:27:00	No highs, no lows, only Doge	DOGE	no	no	no	Link
16	10	06.02.21	05:02:00	Much wow!	DOGE	no	no	no	Link
17		06.02.21	05:51:00	The future currency of Earth [Twitter poll with "Dogecoin to the Moooonn" and "All other crypto combined" as choices]	DOGE	no	no	no	Link
18	11	07.02.21	08:41:00	So … it's finally come to this … [even more edited photo from Disney's Lion King where Musk holds Gene Simmons, who holds Snoop Dogg, who holds a "baby Simba" doge]	DOGE	no	yes	no	Link

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		Date	Time	Text					
19	12	07.02.21	23:25:00	♪ Who let the Doge out ♪	DOGE	no	no	no	Link
20		08.02.21	02:13:00	Ð is for Dogecoin! Instructional video. [*link to a YouTube video about Dogecoin*]	DOGE	no	no	yes	Link
21	13	10.02.21	08:18:00	This is true power haha [*picture of Chuck Norris stating "Chuck Norris can withdraw Bitcoins from Mt. Gox"*]	BTC	no	yes	no	Link
22	14	10.02.21	16:08:00	Bought some Dogecoin for lil X, so he can be a toddler hodler	DOGE	no	no	no	Link
23	15	11.02.21	10:08:00	Frodo was the underdoge, All thought he would fail, Himself most of all. [*picture with pricing of different altcoin/BTC pairs that underperform against BTC; large ring with the Bitcoin logo and the phrase "One coin to rule them all"*]	DOGE	no	yes	no	Link
24	16	15.02.21	00:25:00	If major Dogecoin holders sell most of their coins, it will get my full support. Too much concentration is the only real issue imo.	DOGE	no	no	no	Link
25	17	21.02.21	00:42:00	Cryptocurrency explained [*link to a humorous YouTube video about Bitcoin*]	BTC	no	no	yes	Link
26	18	21.02.21	22:27:00	Dojo 4 Doge	DOGE	no	no	no	Link
27	19	24.02.21	14:00:00	Literally [*picture of a doge holding a doge flag on the moon*]	DOGE	no	yes	no	Link
28		24.02.21	14:10:00	On the actual moon	DOGE	no	no	no	Link
29	20	01.03.21	20:57:00	Doge meme shield (legendary item) [*picture showing a man in camouflage shielding Dogecoin. The picture features the words "Dogecoin vaule dropping", "memes" and "Dogecoin".*]	DOGE	no	yes	no	Link
30	21	02.03.21	18:50:00	Scammers & crypto should get a room	BTC	no	no	no	Link
31	22	06.03.21	05:40:00	Doge spelled backwards is Egod	DOGE	no	no	no	Link
32	23	12.03.21	19:58:00	BTC (Bitcoin) is an anagram of TBC (The Boring Company) What a coincidence!	BTC	no	no	no	Link
33		12.03.21	20:00:00	Both do mining & use blocks & chains		no	no	no	Link
34	24	14.03.21	00:40:00	Doge day afternoon	DOGE	no	no	no	Link
35		14.03.21	00:46:00	Origin of Doge Day Afternoon: The ancient Romans sacrificed a Dogecoin at the beginning of the Doge Days to appease the rage of Sirius, believing that the star was the cause of the hot, sultry weather.	DOGE	no	no	no	Link
36		14.03.21	01:51:00	Why are you so dogematic, they ask	DOGE	no	no	no	Link
37		14.03.21	04:54:00	I'm getting a Shiba Inu #resistanceisfutile	DOGE	no	no	no	Link
38	25	24.03.21	08:02:00	You can now buy a Tesla with Bitcoin	BTC	no	no	no	Link

#	#	Date	Time	Description	Coin				Link
39		24.03.21	08:09:00	Tesla is using only internal & open source software & operates Bitcoin nodes directly. Bitcoin paid to Tesla will be retained as Bitcoin, not converted to fiat currency.	BTC	no	no	no	Link
40		24.03.21	08:10:00	Pay by Bitcoin capability available outside US later this year	BTC	no	no	no	Link
41	26	01.04.21	12:25:00	SpaceX is going to put a literal Dogecoin on the literal moon	DOGE	no	no	no	Link
42	27	09.04.21	09:32:00	*[picture comparing bacteria in nature to bacteria in the lab using two doges for illustration]*	DOGE	yes	no	no	Link
43	28	15.04.21	06:33:00	Doge Barking at the Moon *[picture of a dog barking at the moon]*	DOGE	yes	no	no	Link
44	29	16.04.21	19:01:00	Eyes emoji *[referencing his own tweet from July 2020 with a picture of a "dogecoin standard" flooding the "global financial system"]*	DOGE	no	no	no	Link
45	30	28.04.21	08:20:00	The Dogefather SNL May 8	DOGE	no	no	no	Link
46	31	07.05.21	18:24:00	Cryptocurrency is promising, but please invest with caution! *[link to a video entitled "Elon Musk Says Dogecoin Could Be the Future of Cryptocurrency | TMZ" - an interview in which he comments on the future of cryptocurrency, speculation and risks for investors]*	DOGE	no	no	yes	Link
47	32	10.05.21	00:41:00	SpaceX launching satellite Doge-1 to the moon next year – Mission paid for in Doge – 1st crypto in space – 1st meme in space To the mooooonm!! *[link to a video entitled "Dogecoin Song - To the Moon"]*	DOGE	no	no	yes	Link
48	33	11.05.21	10:13:00	Do you want Tesla to accept Doge? *[Twitter poll with "Yes" and "No" as choices]*	DOGE	no	no	no	Link
49	34	13.05.21	00:06:00	Tesla & Bitcoin *[picture with the caption: "Tesla has suspended vehicle purchases using Bitcoin. We are concerned about rapidly increasing use of fossil fuels for Bitcoin mining and transactions, especially coal, which has the worst emissions of any fuel. Cryptocurrency is a good idea on many levels and we believe it has a promising future, but this cannot come at great cost to the environment. Tesla will not be selling any Bitcoin and we intend to use it for transactions as soon as mining transitions to more sustainable energy. We are also looking at other cryptocurrencies that use <1% of Bitcoin's energy/transaction."]*	BTC	no	yes	no	Link
50	35	13.05.21	11:54:00	Energy usage trend over past few months is insane cbeci.org *[picture showing Bitcoin's estimated energy consumption over time]*	BTC	yes	yes	no	Link
51	36	14.05.21	00:45:00	Working with Doge devs to improve system transaction efficiency. Potentially promising.	DOGE	no	no	no	Link
52	37	19.05.21	16:42:00	Tesla has	BTC	no	no	no	Link
53		19.05.21	17:41:00	Credit to our Master of Coin	BTC	no	no	no	Link
54	38	20.05.21	12:41:00	How much is that Doge in the window? *[picture showing the word "Cyberviking" and a dollar bill with a doge logo on a laptop]*	DOGE	no	yes	no	Link

55	39	24.05.21	21:42:00	Spoke with North American Bitcoin miners. They committed to publish current & planned renewable usage & to ask miners WW to do so. Potentially promising.	BTC	no	no	no	Link
56	40	24.05.21	21:49:00	If you'd like to help develop Doge, please submit ideas on GitHub & http://reddit.com/r/dogecoin/ @dogecoin_devs	DOGE	yes	no	no	Link
57		24.05.21	22:29:00	Someone suggested changing Dogecoin fees based on phases of the moon, which is pretty awesome haha	DOGE	no	no	no	Link
58	41	02.06.21	09:05:00	Found this pic of me as a child [*picture of a doge in front of a computer stating "1980: I have to keep my passen hidden from the public or I'll be socially ostracized".*]	DOGE	no	yes	no	Link
59	42	04.06.21	03:07:00	#Bitcoin 💙 [*picture of a couple's conversation: "Her: I know I said it would be over between us if you quoted another Linkin Park song but I've found someone else. Him: So in the end it didn't even matter?"*]	BTC	no	yes	no	Link
60		04.06.21	04:49:00	[*picture of a couple's video chat where the male cries because of falling prices on a financial market*]	BTC	no	yes	no	Link
61	43	25.06.21	04:10:00	How many Bitcoin maxis does it take to screw in a lightbulb?	BTC	no	no	no	Link
62		25.06.21	04:11:00	"That's not funny!" – Bitcoin maxis	BTC	no	no	no	Link
63	44	25.06.21	13:03:00	My Shiba Inu will be named Floki	DOGE	no	no	no	Link
64	45	01.07.21	10:43:00	Release the Doge! [*picture from the movie The Godfather with the caption "You come to me at runtime to tell me the code you are executing does not compile".*]	DOGE	no	yes	no	Link
65		01.07.21	11:24:00	Baby Doge, doo, doo, doo, doo, doo, Baby Doge, doo, doo, doo, doo, doo, Baby Doge, doo, doo, doo, doo, Baby Doge	DOGE	no	no	no	Link
66	46	02.07.21	15:20:00	[*picture of a male solely focusing on his laptop with a dogecoin price charts stating "Polytopia", while women are kissing around him.*]	DOGE	no	yes	no	Link
67	47	25.07.21	06:23:00	[*picture from the movie Matrix where Neo asks: "What are you trying to tell me, that I can make a lot of money with Dogecoin?" A doge resembling Morpheus answers: "No, Neo. I'm trying to tell you that Dogecoin is money."*]	DOGE	no	yes	no	Link

Declarations

Availability of data and materials

The datasets used and/or analyzed during the current study are publicly available.

Conflicts of interest

Not applicable.

Funding

Not applicable.

Acknowledgements

The author thanks Elias Strehle and Ingo Fiedler for reviewing an earlier version of the manuscript.

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